

Paul, Schulwitz please

Access DB# 87588

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: SABITA GAZI Examiner #: 74141 Date: 2/26/2003  
Art Unit: 1612 Phone Number 305-3910 Serial Number: 161014, 665  
Mail Box and Bldg/Room Location: 2017 Results Format Preferred (circle): PAPER DISK E-MAIL  
3807

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Process for the production of Oxandrolone

Inventors (please provide full names): BESAI, Shaileskumar Ramakrishna et al.

Earliest Priority Filing Date: 12/11/2001

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search for the production  
of Oxandrolone as in cl. 1, 6, 15,  
20 & 22

Please see attached sheets

Thank you

POINT OF CONTACT:  
PAUL SCHULWITZ  
TECHNICAL INFO. SPECIALIST  
CM1 6806 TEL. (703) 305-1954

### STAFF USE ONLY

#### Type of Search

#### Vendors and cost where applicable

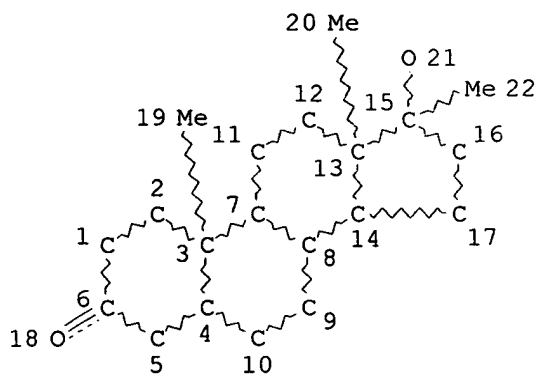
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Searcher Location: _____	Structure (#) <u>2</u>	Questel/Orbit _____
Date Searcher Picked Up: <u>2/27</u>	Bibliographic _____	Dr.Link _____
Date Completed: <u>2/27</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>20</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>16</u>	Other _____	Other (specify) _____

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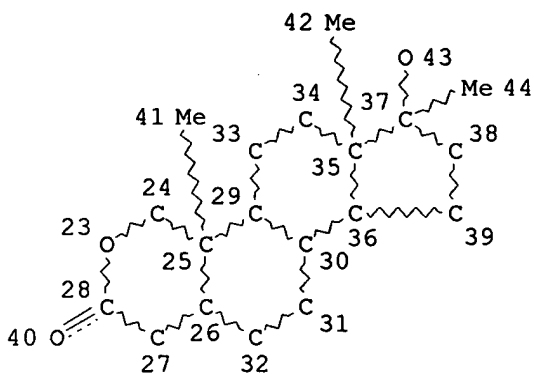
L10

STR

RRT



PRO



## NODE ATTRIBUTES:

CONNECT IS E1 RC AT 21

CONNECT IS E1 RC AT 43

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 44

## STEREO ATTRIBUTES: NONE

L12 2 SEA FILE=CASREACT SSS FUL L10 ( 7 REACTIONS)

=&gt; d ibib ab crd 1-2

L12 ANSWER 1 OF 2 CASREACT COPYRIGHT 2003 ACS

ACCESSION NUMBER: 138:24880 CASREACT

TITLE: Process for preparing oxandrolone from  
17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstane-3-one

INVENTOR(S): Cabaj, John E.; Kairys, David L.; Zizelman, Paul M.

PATENT ASSIGNEE(S): Cedarburg Pharmaceuticals, LLC, USA

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002100881	A1	20021219	WO 2002-US15231	20020515
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,				

PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2003032817 A1 20030213

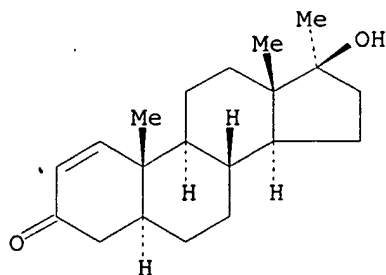
US 2002-146595 20020515

PRIORITY APPLN. INFO.:

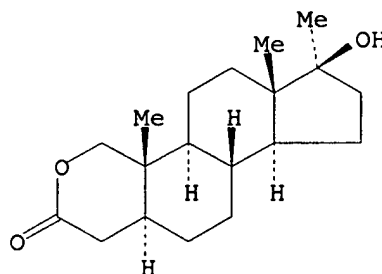
US 2001-290966P 20010515

AB The present invention discloses a process for synthesizing oxandrolone (I) from 17.β.-hydroxy-17.α.-methyl-5.α.-androstan-3-one II [R = H; dashed bond = single bond (III)]. The process involves bromination of III to obtain II [R = Br, dashed bond = single bond (IV)], followed by the highly selective de-bromination of IV to obtain .DELTA.1-unsatd. steroid II [R = H; dashed bond = double bond (V)], followed by the oxidn. of V to obtain 17.β.-hydroxy-17.α.-methyl-1-oxo-1,2-seco-A-nor-5.α.-androstan-2-oic acid (VI). Redn. of VI afforded I (86% yield).

RX(7) OF 10 - 2 STEPS

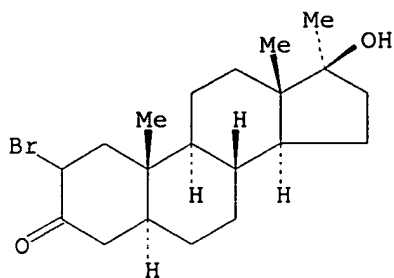


1. Ozone, MeOH  
 2.1. NaOH, EtOH,  
 Water  
 2.2. NaBH<sub>4</sub>  
 2.3. HCl, Water

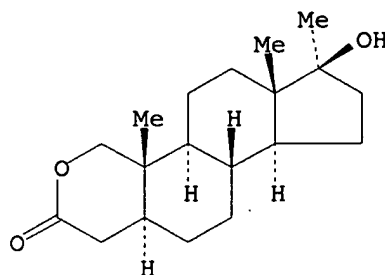


86%

## RX(9) OF 10 - 3 STEPS



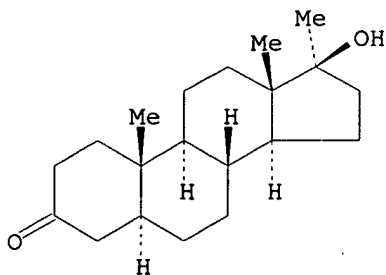
1. LiBr, Li<sub>2</sub>CO<sub>3</sub>, AcNMe<sub>2</sub>
2. Ozone, MeOH
- 3.1. NaOH, EtOH, Water
- 3.2. NaBH<sub>4</sub>
- 3.3. HCl, Water



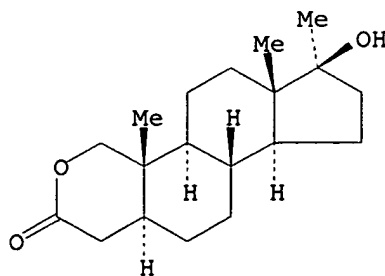
86%

NOTE: 1) optimization study

## RX(10) OF 10 - 4 STEPS



1. Jacques reagent, CH<sub>2</sub>Cl<sub>2</sub>
2. LiBr, Li<sub>2</sub>CO<sub>3</sub>, AcNMe<sub>2</sub>
3. Ozone, MeOH
- 4.1. NaOH, EtOH, Water
- 4.2. NaBH<sub>4</sub>
- 4.3. HCl, Water



86%

NOTE: 1) optimization study, 2) optimization study

REFERENCE COUNT:

11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L12 ANSWER 2 OF 2 CASREACT COPYRIGHT 2003 ACS

ACCESSION NUMBER: 107:176308 CASREACT

TITLE: A facile two-step high-yield approach to 2-oxasteroids

AUTHOR(S): Frimer, Aryeh A.; Hameiri-Buch, Judith; Ripshtos, Shlomo; Gilinsky-Sharon, Pessia

CORPORATE SOURCE: Dep. Chem., Bar-Ilan Univ., Ramat Gan, 52100, Israel

SOURCE: Tetrahedron (1986), 42(20), 5693-706

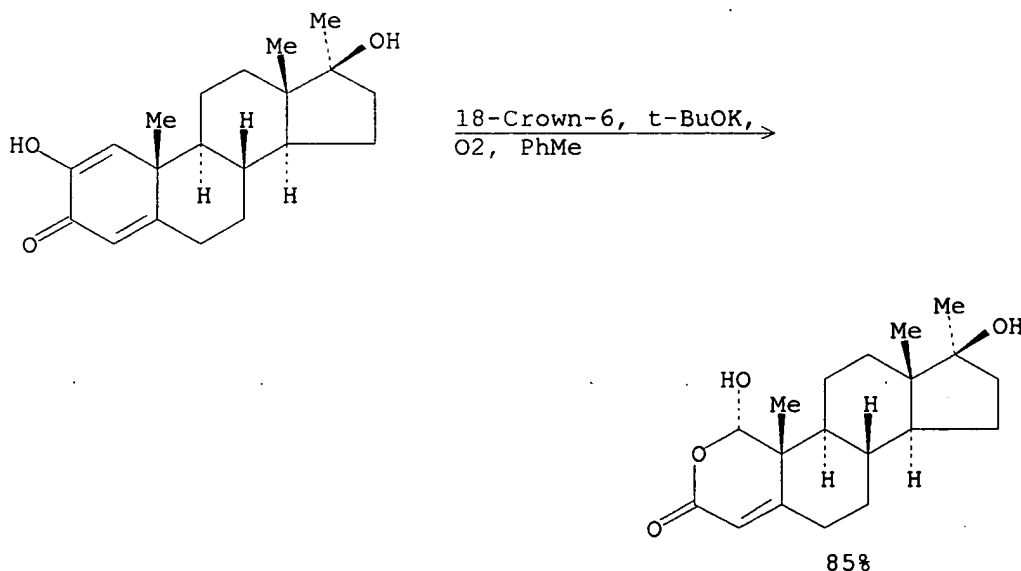
CODEN: TETRAB; ISSN: 0040-4020

DOCUMENT TYPE: Journal

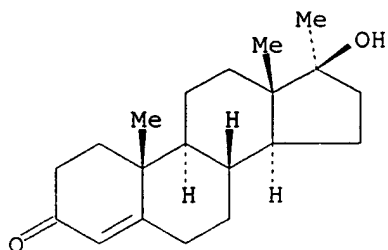
LANGUAGE: English

AB The base catalyzed autoxidn. of 3-oxo-.DELTA.4 steroids in aprotic media at -25.degree. occurs at C-2 of the A-ring, to give in high yield the 2-hydroxy-3-oxo-.DELTA.1,4 derivs. (enols). When the reaction is then allowed to continue at room temp. for several days, the enols are further autoxidized to the 1-hydroxy-2-oxa-3-oxo-.DELTA.4 derivs. (lactols) in 85-95% overall yields. NaBH4 redn. of the lactols yield the pharmacol. important 2-oxasteroids. Thus, treatment of hydroxyprogesterone I with tert-BuOK and 18-crown-6 in toluene at -20 in the presence of O gave 89% enol II, which on repeated treatment gave 95% lactol III (R = OH). NaBH4 redn. of III (R = OH) gave III (R = H). The proton and C-13 NMR spectra of the enols, lactols, and 2-oxasteroids was studied.

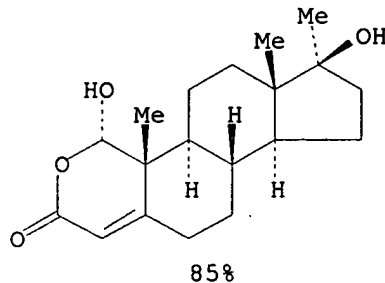
RX(10) OF 25



RX(18) OF 25 - 2 STEPS

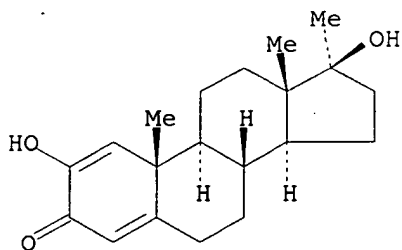


1. 18-Crown-6, t-BuOK, O<sub>2</sub>, PhMe
2. 18-Crown-6, t-BuOK, O<sub>2</sub>, PhMe

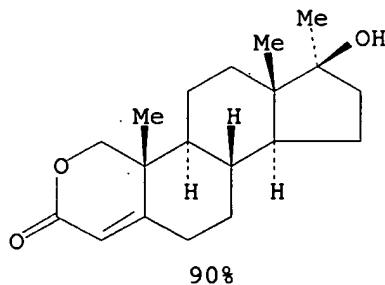


85%

RX(22) OF 25 - 2 STEPS

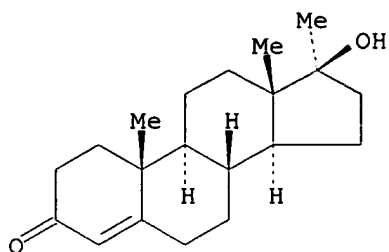


1. 18-Crown-6, t-BuOK, O<sub>2</sub>, PhMe
2. NaBH<sub>4</sub>, NaOH, Water

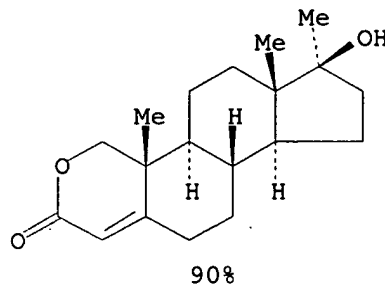


90%

RX(25) OF 25 - 3 STEPS



1. 18-Crown-6, t-BuOK, O<sub>2</sub>, PhMe
2. 18-Crown-6, t-BuOK, O<sub>2</sub>, PhMe
3. NaBH<sub>4</sub>, NaOH, Water



90%

Claims 1, 6, 15, 20

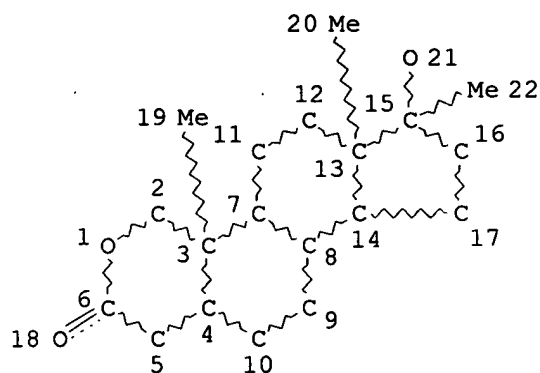
Qazi 10/014,665

February 27, 2003

=> d que

L1

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NODE ATTRIBUTES:

CONNECT IS E1 RC AT 21

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

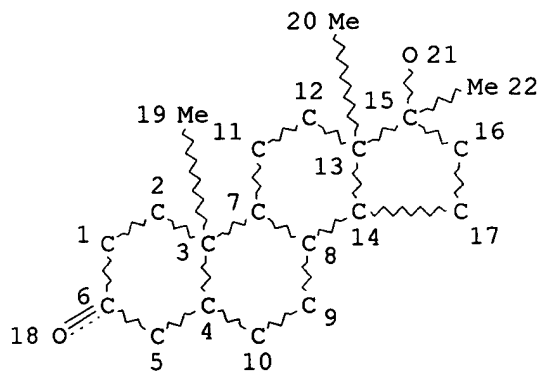
NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L3 25 SEA FILE=REGISTRY SSS FUL L1

L4

STR



NODE ATTRIBUTES:

CONNECT IS E1 RC AT 21

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L6 1247 SEA FILE=REGISTRY SSS FUL L4

L7

12 SEA FILE=HCAPLUS ABB=ON PLU=ON L3(L) PREP/RL



L8 227 SEA FILE=HCAPLUS ABB=ON PLU=ON L6(L) (RACT OR RCT OR RGT)/RL  
 L9 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L7 AND L8

=> d ibib abs hitstr 19 1-5

L9 ANSWER 1 OF 5 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:964377 HCAPLUS

DOCUMENT NUMBER: 138:24880

TITLE: Process for preparing oxandrolone from  
 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one

INVENTOR(S): Cabaj, John E.; Kairys, David L.; Zizelman, Paul M.

PATENT ASSIGNEE(S): Cedarburg Pharmaceuticals, LLC, USA

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

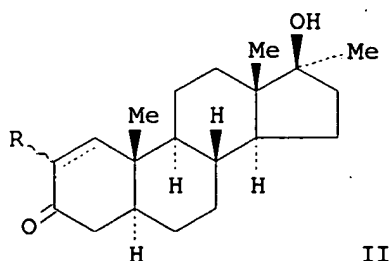
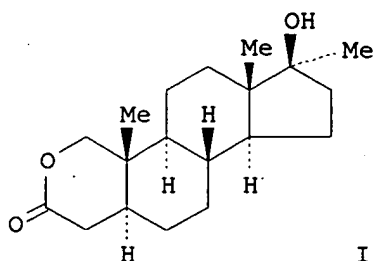
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002100881	A1	20021219	WO 2002-US15231	20020515
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2003032817	A1	20030213	US 2002-146595	20020515

PRIORITY APPLN. INFO.:

US 2001-290966P P 20010515

OTHER SOURCE(S): CASREACT 138:24880

GI



AB The present invention discloses a process for synthesizing oxandrolone (I) from 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one II [R = H; dashed bond = single bond (III)]. The process involves bromination of III to obtain II [R = Br, dashed bond = single bond (IV)], followed by the

highly selective de-bromination of IV to obtain .DELTA.1-unsatd. steroid II [R = H; dashed bond = double bond (V)], followed by the oxidn. of V to obtain 17.beta.-hydroxy-17.alpha.-methyl-1-oxo-1,2-seco-A-nor-5.alpha.-androstan-2-oic acid (VI). Redn. of VI afforded I (86% yield).

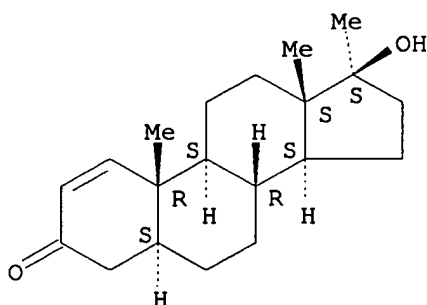
IT 65-04-3P 74252-42-9P

RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(process for prepg. oxandrolone from 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one)

RN 65-04-3 HCAPLUS

CN Androst-1-en-3-one, 17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI) (CA INDEX NAME)

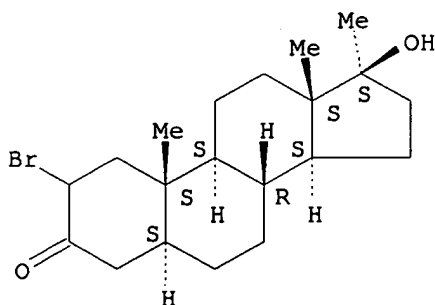
Absolute stereochemistry.



RN 74252-42-9 HCAPLUS

CN Androstan-3-one, 2-bromo-17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI)  
(CA INDEX NAME)

Absolute stereochemistry.



IT 53-39-4P, Oxandrolone

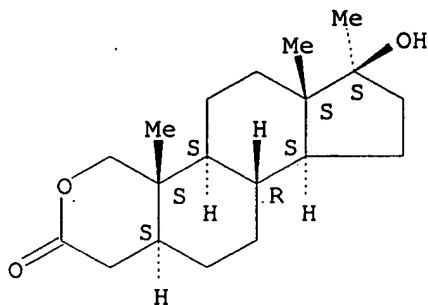
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(process for prepg. oxandrolone from 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one)

RN 53-39-4 HCAPLUS

CN Cyclopenta[5,6]naphtho[1,2-c]pyran-2(1H)-one, tetradecahydro-7-hydroxy-4a,6a,7-trimethyl-, (4aS,4bS,6aS,7S,9aS,9bR,11aS)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



IT 521-11-9, Methylandrostanolone

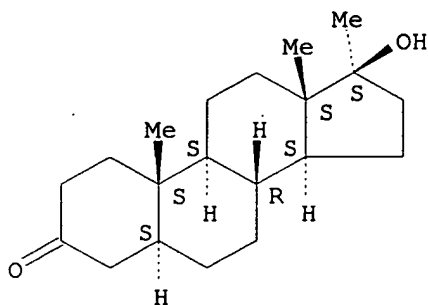
RL: RCT (Reactant); RACT (Reactant or reagent)

(process for prepg. oxandrolone from 17.β.-hydroxy-17.α.-methyl-5.α.-androstan-3-one)

RN 521-11-9 HCAPLUS

CN Androstan-3-one, 17-hydroxy-17-methyl-, (5.α.,17.β.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 5 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1993:81236 HCAPLUS

DOCUMENT NUMBER: 118:81236

TITLE: 17-Epimerization of 17.α.-methyl anabolic steroids in humans: metabolism and synthesis of 17.α.-hydroxy-17.β.-methyl steroids

AUTHOR(S): Schaenzer, Willi; Opfermann, Georg; Donike, Manfred  
CORPORATE SOURCE: Inst. Biochem., Dtsch. Sporthochsch., Cologne, D-5000/41, Germany

SOURCE: Steroids (1992), 57(11), 537-50  
CODEN: STEDAM; ISSN: 0039-128X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The 17-epimers of the anabolic steroids bolasterone, 4-chlorodehydromethyltestosterone, fluoxymesterone, furazabol, metandienone, mestanolone, methyltestosterone, methandriol, oxandrolone, oxymesterone, oxymetholone, stanozolol, and the human metabolites 7.α.,17.α.-

dimethyl-5.beta.-androstane-3.alpha.,17.beta.-diol , 6.beta.-hydroxy-metandienone, 17.alpha.-methyl-5.beta.-androst-1-ene-3.alpha.,17.beta.-diol, 3'-hydroxystanozolol, as well as the ref. substances 17.beta.-hydroxy-17.alpha.-methyl-5.beta.-androst-3-one, 17.beta.-hydroxy-17.alpha.-methyl-5.beta.-androst-1-en-3-one, the four isomers of 17-methyl-5-androstane-3,17-diol, and 17.beta.-hydroxy-7.alpha.,17.alpha.-dimethyl-5.beta.-androst-3-one were synthesized via a 17.beta.-sulfate that spontaneously hydrolyzed in water to several dehydration products, and to the 17.alpha.-hydroxy-17.beta.-Me epimer. The 17.beta.-sulfate was prepd. by reaction of the 17.beta.-hydroxy-17.alpha.-Me steroid with sulfur trioxide-pyridine complex. The 17.beta.-Me epimers are eluted in gas chromatog. as trimethylsilyl derivs. before the corresponding 17.alpha.-Me epimers. The electron impact mass spectra of the underivatized and trimethylsilylated epimers are in most cases identical and a differentiation between the 17-epimers was possible only in 3 cases . <sup>1</sup>H NMR spectra show for the 17.beta.-Me epimer a chem. shift for the C-18 protons (singlet) of about 0.175 ppm (in CDCl<sub>3</sub>) to a lower field. <sup>13</sup>C NMR spectra display differences for the 17-epimeric steroids in shielding effects for carbons 12-18 and 20. Excretion studies with the anabolic steroids with identification and quantification of 17-epimeric metabolites indicate that the extent of 17-epimerization depends on the A-ring structure and shows a great variation for the different 17.alpha.-Me anabolic steroids.

IT 3275-58-9 13610-99-6 33526-41-9

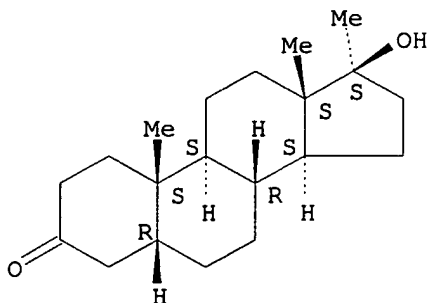
35937-38-3

RL: RCT (Reactant); RACT (Reactant or reagent)  
(epimerization of)

RN 3275-58-9 HCAPLUS

CN Androstan-3-one, 17-hydroxy-17-methyl-, (5.beta.,17.beta.)- (9CI) (CA INDEX NAME)

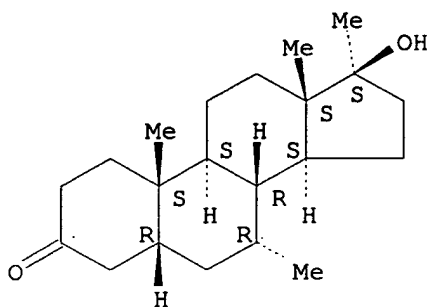
Absolute stereochemistry.



RN 13610-99-6 HCAPLUS

CN Androstan-3-one, 17-hydroxy-7,17-dimethyl-, (5.beta.,7.alpha.,17.beta.)- (9CI) (CA INDEX NAME)

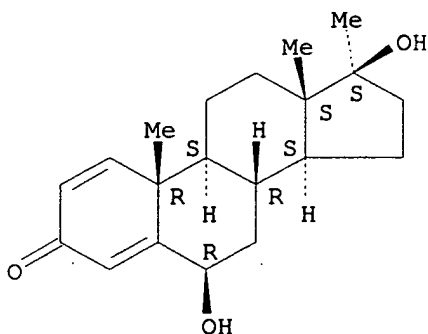
Absolute stereochemistry.



RN 33526-41-9 HCAPLUS

CN Androsta-1,4-dien-3-one, 6,17-dihydroxy-17-methyl-, (6.beta.,17.beta.)-  
(9CI) (CA INDEX NAME)

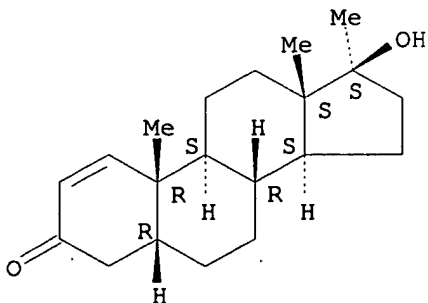
Absolute stereochemistry.



RN 35937-38-3 HCAPLUS

CN Androst-1-en-3-one, 17-hydroxy-17-methyl-, (5.beta.,17.beta.)- (9CI) (CA  
INDEX NAME)

Absolute stereochemistry.



IT 58-18-4 72-63-9, Metandienone 145-12-0,

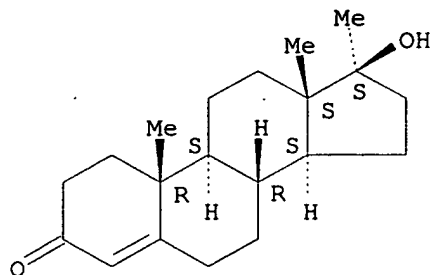
Oxymesterone 521-11-9, Mestanolone

RL: RCT (Reactant); RACT (Reactant or reagent)  
(epimerization, metab., and NMR of)

RN 58-18-4 HCAPLUS

CN Androst-4-en-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA INDEX NAME)

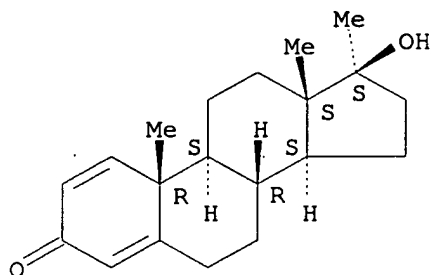
Absolute stereochemistry.



RN 72-63-9 HCAPLUS

CN Androsta-1,4-dien-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA INDEX NAME)

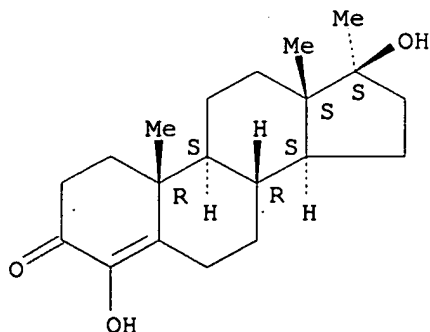
Absolute stereochemistry.



RN 145-12-0 HCAPLUS

CN Androst-4-en-3-one, 4,17-dihydroxy-17-methyl-, (17.beta.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

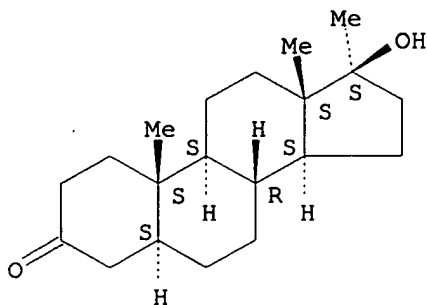


RN 521-11-9 HCAPLUS

CN Androstan-3-one, 17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI) (CA

INDEX NAME)

Absolute stereochemistry.



IT 26624-15-7P

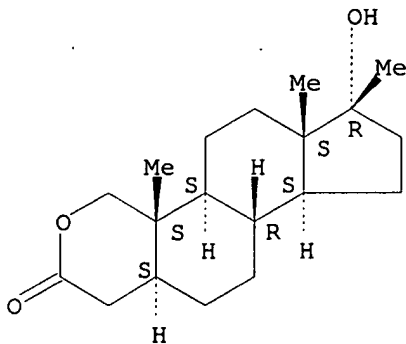
RL: PRP (Properties); SPN (Synthetic preparation); **PREP****(Preparation)**

(prepn. and carbon-13 NMR of)

RN 26624-15-7 HCAPLUS

CN Cyclopenta[5,6]naphtho[1,2-c]pyran-2(1H)-one, tetradecahydro-7-hydroxy-4a,6a,7-trimethyl-, (4aS,4bS,6aS,7R,9aS,9bR,11aS)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



IT 145761-22-4P

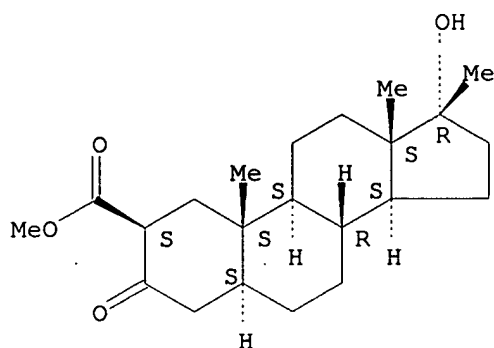
RL: **RCT (Reactant)**; SPN (Synthetic preparation); **PREP****(Preparation); RACT (Reactant or reagent)**

(prepn. and hydrazinolysis of)

RN 145761-22-4 HCAPLUS

CN Androstane-2-carboxylic acid, 17-hydroxy-17-methyl-3-oxo-, methyl ester, (2.beta.,5.alpha.,17.alpha.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



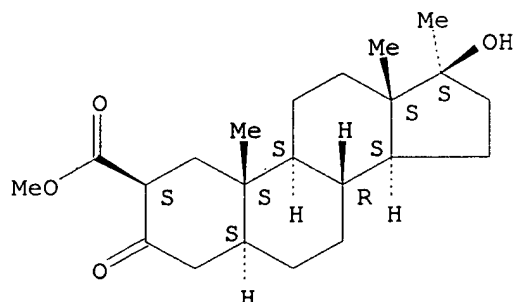
IT 129545-91-1

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of, with sulfur trioxide)

RN 129545-91-1 HCAPLUS

CN Androstane-2-carboxylic acid, 17-hydroxy-17-methyl-3-oxo-, methyl ester,  
(2.beta.,5.alpha.,17.beta.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



L9 ANSWER 3 OF 5 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1992:551203 HCAPLUS

DOCUMENT NUMBER: 117:151203

TITLE: Studies on anabolic steroids. 9. Tertiary sulfates  
of anabolic 17.alpha.-methyl steroids: synthesis and  
rearrangement

AUTHOR(S): Bi, Honggang; Masse, Robert; Just, George

CORPORATE SOURCE: INRS-Sante, Univ. Quebec, Pointe-Claire, QC, H9R 1G6,  
Can.

SOURCE: Steroids (1992), 57(7), 306-12

CODEN: STEDAM; ISSN: 0039-128X

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A simple and convenient method has been developed to prep. sulfates of anabolic 17.beta.-hydroxy-17.alpha.-Me steroids. The sulfates of methandienone, 17.alpha.-methyltestosterone, mestanolone, oxandrolone, and stanozolol were prepd. Different A-ring functions were not affected under the sulfation condition. The buffered hydrolyses of these sulfates provided the 17-epimers of the original steroids and 17,17-dimethyl-18-nor-13(14)-ene steroids, presumably via the 17-carbocations.



IT 26624-15-7P

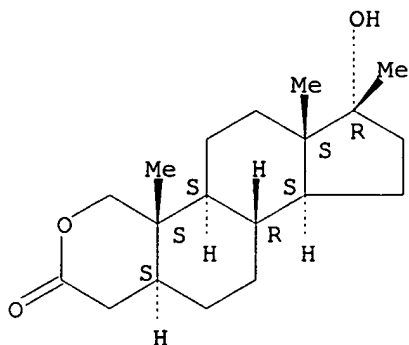
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(Preparation)

(prepn. and carbon-13 NMR of)

RN 26624-15-7 HCAPLUS

CN Cyclopenta[5,6]naphtho[1,2-c]pyran-2(1H)-one, tetradecahydro-7-hydroxy-4a,6a,7-trimethyl-, (4aS,4bS,6aS,7R,9aS,9bR,11aS)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



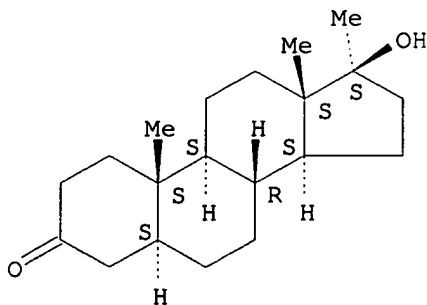
IT 521-11-9

RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**  
(reaction of, with chlorosulfonic acid)

RN 521-11-9 HCAPLUS

CN Androstan-3-one, 17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



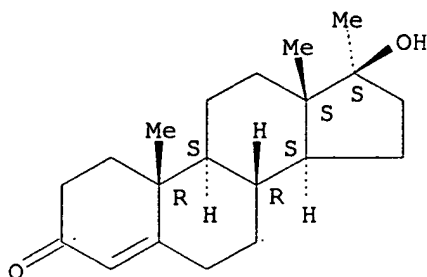
IT 58-18-4 72-63-9, Methandienone

RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**  
(reaction of, with chlorosulfonic acid, tertiary sulfate by)

RN 58-18-4 HCAPLUS

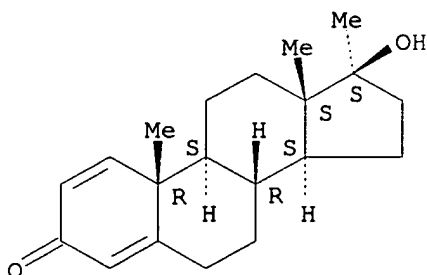
CN Androst-4-en-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

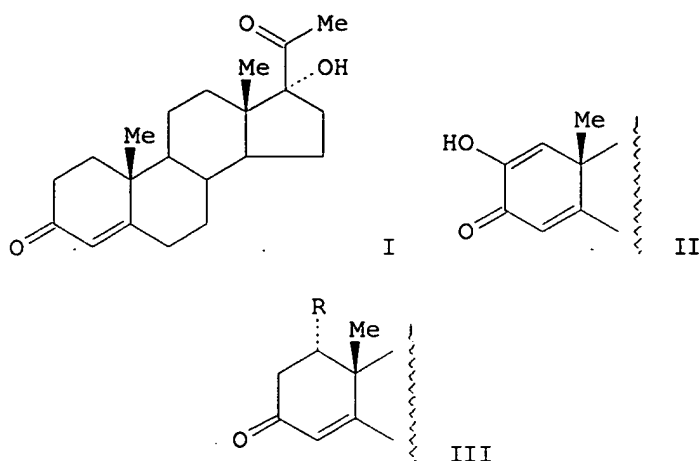


RN 72-63-9 HCAPLUS  
CN Androsta-1,4-dien-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA  
INDEX NAME)

Absolute stereochemistry.



L9 ANSWER 4 OF 5 HCAPLUS COPYRIGHT 2003 ACS  
ACCESSION NUMBER: 1987:576308 HCAPLUS  
DOCUMENT NUMBER: 107:176308  
TITLE: A facile two-step high-yield approach to 2-oxasteroids  
AUTHOR(S): Frimer, Aryeh A.; Hameiri-Buch, Judith; Ripshtos,  
Shlomo; Gilinsky-Sharon, Pessia  
CORPORATE SOURCE: Dep. Chem., Bar-Ilan Univ., Ramat Gan, 52100, Israel  
SOURCE: Tetrahedron (1986), 42(20), 5693-706  
CODEN: TETRAB; ISSN: 0040-4020  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 107:176308  
GI



AB The base catalyzed autoxidn. of 3-oxo-.DELTA.4 steroids in aprotic media at -25.degree. occurs at C-2 of the A-ring, to give in high yield the 2-hydroxy-3-oxo-.DELTA.1,4 derivs. (enols). When the reaction is then allowed to continue at room temp. for several days, the enols are further autoxidized to the 1-hydroxy-2-oxa-3-oxo-.DELTA.4 derivs. (lactols) in 85-95% overall yields. NaBH<sub>4</sub> redn. of the lactols yield the pharmacol. important 2-oxasteroids. Thus, treatment of hydroxyprogesterone I with tert-BuOK and 18-crown-6 in toluene at -20 in the presence of O gave 89% enol II, which on repeated treatment gave 95% lactol III (R = OH). NaBH<sub>4</sub> redn. of III (R = OH) gave III (R = H). The proton and C-13 NMR spectra of the enols, lactols, and 2-oxasteroids was studied.

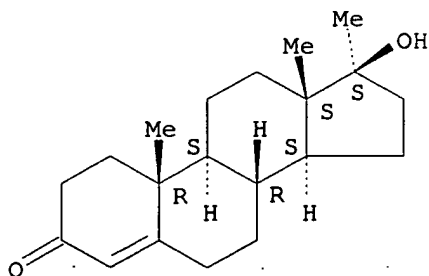
IT 58-18-4

RL: RCT (Reactant); RACT (Reactant or reagent)  
(autoxidn. of)

RN 58-18-4 HCAPLUS

CN Androst-4-en-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



IT 2304-17-8P

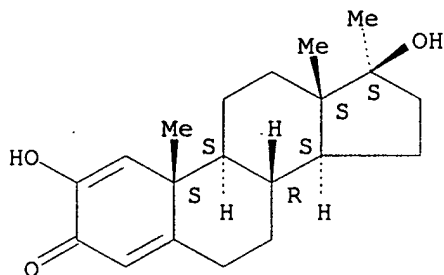
RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(Preparation); RACT (Reactant or reagent)  
(prepn. and autoxidn. of)

RN 2304-17-8 HCAPLUS

CN Androsta-1,4-dien-3-one, 2,17-dihydroxy-17-methyl-, (17.beta.)- (9CI) (CA

INDEX NAME)

Absolute stereochemistry.



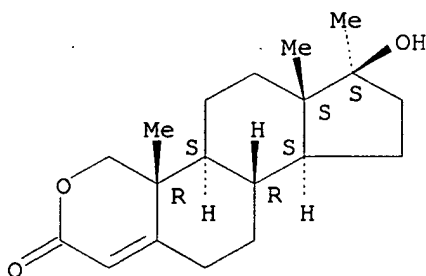
IT 92473-02-4P 110716-65-9P

RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
**(Preparation)**; RACT (Reactant or reagent)  
 (prepn. and redn. of)

RN 92473-02-4 HCAPLUS

CN Cyclopenta[5,6]naphtho[1,2-c]pyran-2(4H)-one,  
 4a,4b,5,6,6a,7,8,9,9a,9b,10,11-dodecahydro-7-hydroxy-4a,6a,7-trimethyl-,  
 (4aR,4bS,6aS,7S,9aS,9bR)- (9CI) (CA INDEX NAME)

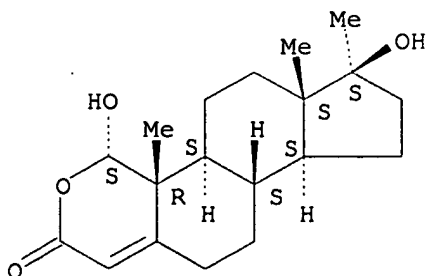
Absolute stereochemistry.



RN 110716-65-9 HCAPLUS

CN Cyclopenta[5,6]naphtho[1,2-c]pyran-2(4H)-one,  
 4a,4b,5,6,6a,7,8,9,9a,9b,10,11-dodecahydro-4,7-dihydroxy-4a,6a,7-trimethyl-,  
 (4S,4aR,4bS,6aS,7S,9aS,9bS)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



L9 ANSWER 5 OF 5 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 1972:462220 HCAPLUS

DOCUMENT NUMBER: 77:62220

TITLE: Steroids. XVII. Oxidation of 17.alpha.-methylandrosta-1,4-dien-17.beta.-ol-3-one with hydrogen peroxide

AUTHOR(S): Kocor, M.; Kurek, A.

CORPORATE SOURCE: Inst. Org. Chem., Pol. Acad. Sci., Warsaw, Pol.

SOURCE: Bulletin de l'Academie Polonaise des Sciences, Serie des Sciences Chimiques (1971), 19(3), 167-70

CODEN: BAPCAQ; ISSN: 0001-4095

DOCUMENT TYPE: Journal

LANGUAGE: English

GI For diagram(s), see printed CA Issue.

AB The title compd. (I) was oxidized with H<sub>2</sub>O<sub>2</sub> in MeOH-NaOH to the diepoxy ketone (II) and the epoxy lactone esters (III, IV); II was similarly oxidized to III. Redn. of II with LiAlH<sub>4</sub> in THF gave the epimeric tetrols (V, VI, R = H), which were acetylated to give V and VI (R = Ac), resp. II was also reduced with KBH<sub>4</sub> to give the epimeric epoxy diol (VII).

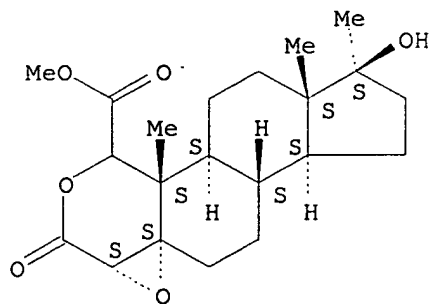
IT 38367-99-6P 38368-00-2P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prep. of)

RN 38367-99-6 HCAPLUS

CN 4H-Cyclopenta[5,6]naphth[1,2-c]oxireno[d]pyran-4-carboxylic acid, tetradecahydro-7-hydroxy-4a,6a,7-trimethyl-2-oxo-, methyl ester, (1aS,4aS,4bS,6aS,7S,9aS,9bS,11aS)-[partial]- (9CI) (CA INDEX NAME)

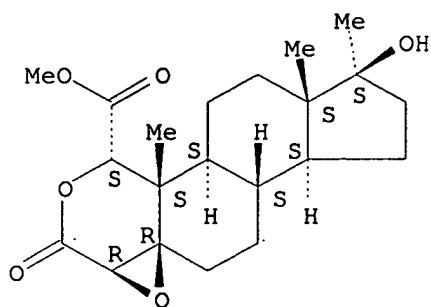
Absolute stereochemistry.



RN 38368-00-2 HCAPLUS

CN 4H-Cyclopenta[5,6]naphth[1,2-c]oxireno[d]pyran-4-carboxylic acid, tetradecahydro-7-hydroxy-4a,6a,7-trimethyl-2-oxo-, methyl ester, [1aR-(1a.alpha.,4.alpha.,4a.beta.,4b.alpha.,6a.beta.,7.beta.,9a.alpha.,9b.beta.,11aR\*)]- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



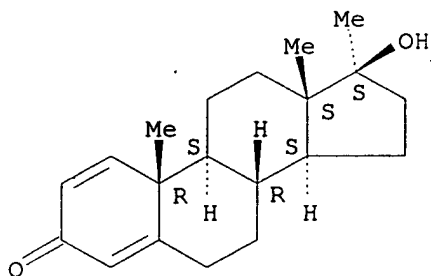
IT 72-63-9

RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction with hydrogen peroxide)

RN 72-63-9 HCAPLUS

CN Androsta-1,4-dien-3-one, 17-hydroxy-17-methyl-, (17.beta.)- (9CI) (CA  
INDEX NAME)

Absolute stereochemistry.



# Claim 22

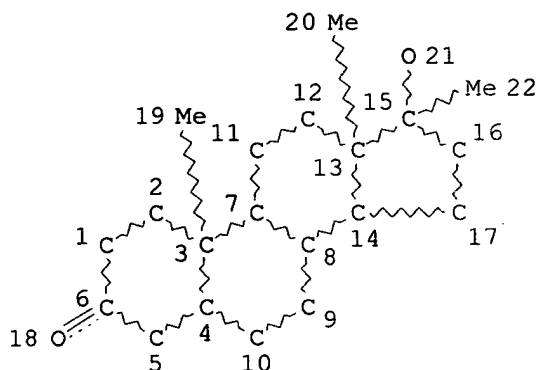
Qazi 10/014,665

February 27, 2003

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L4

STR



NODE ATTRIBUTES:

CONNECT IS E1 RC AT 21

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

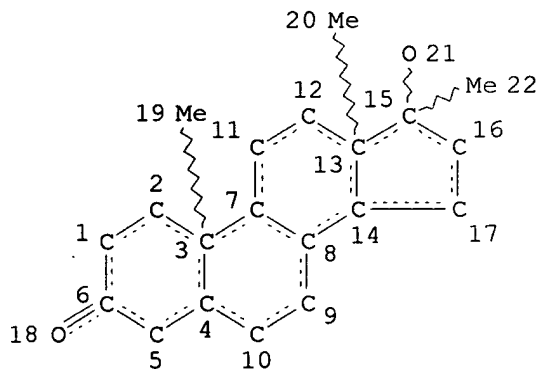
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STEREO ATTRIBUTES: NONE

L6 1247 SEA FILE=REGISTRY SSS FUL L4

L26

STR



NODE ATTRIBUTES:

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DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

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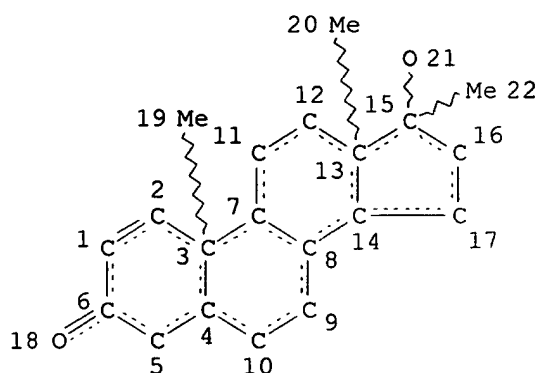
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NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L27

STR



## NODE ATTRIBUTES:

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 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 22

## STEREO ATTRIBUTES: NONE

L28 333 SEA FILE=REGISTRY SUB=L6 SSS FUL L26  
 L29 61 SEA FILE=REGISTRY SUB=L6 SSS FUL L27  
 L30 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L28 (L) (RACT OR RGT OR  
 RCT)/RL AND L29 (L) PREP/RL

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L30 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2003 ACS

ACCESSION NUMBER: 2002:964377 HCAPLUS

DOCUMENT NUMBER: 138:24880

TITLE: Process for preparing oxandrolone from  
 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstane-3-  
 one

INVENTOR(S): Cabaj, John E.; Kairys, David L.; Zizelman, Paul M.

PATENT ASSIGNEE(S): Cedarburg Pharmaceuticals, LLC, USA

SOURCE: PCT Int. Appl., 28 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

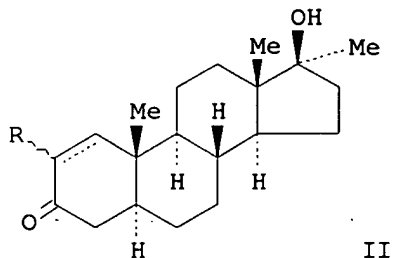
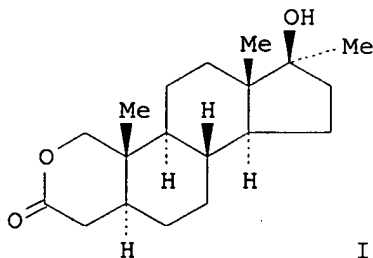
## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002100881	A1	20021219	WO 2002-US15231	20020515
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				



RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

US 2003032817 A1 20030213 US 2002-146595 20020515  
PRIORITY APPLN. INFO.: US 2001-290966P P 20010515  
OTHER SOURCE(S): CASREACT 138:24880  
GI



AB The present invention discloses a process for synthesizing oxandrolone (I) from 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one II [R = H; dashed bond = single bond (III)]. The process involves bromination of III to obtain II [R = Br, dashed bond = single bond (IV)], followed by the highly selective de-bromination of IV to obtain .DELTA.1-unsatd. steroid II [R = H; dashed bond = double bond (V)], followed by the oxidn. of V to obtain 17.beta.-hydroxy-17.alpha.-methyl-1-oxo-1,2-seco-A-nor-5.alpha.-androstan-2-oic acid (VI). Redn. of VI afforded I (86% yield).

IT 65-04-3P 74252-42-9P

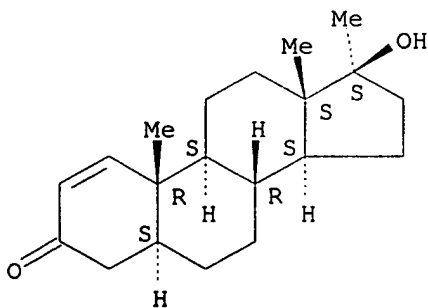
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(process for prepg. oxandrolone from 17.beta.-hydroxy-17.alpha.-methyl-5.alpha.-androstan-3-one)

RN 65-04-3 HCAPLUS

CN Androst-1-en-3-one, 17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI) (CA INDEX NAME)

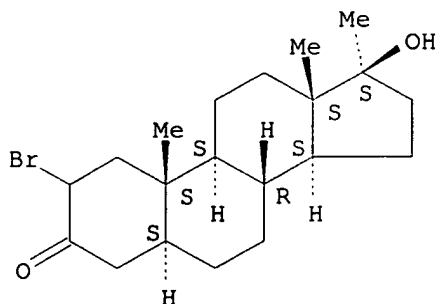
Absolute stereochemistry.



RN 74252-42-9 HCAPLUS

CN Androstan-3-one, 2-bromo-17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI)  
(CA INDEX NAME)

Absolute stereochemistry.



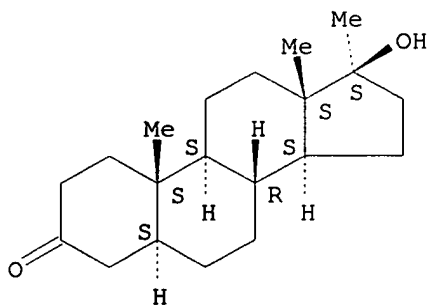
IT 521-11-9, Methylandrostanolone

RL: RCT (Reactant); RACT (Reactant or reagent)  
(process for prep. oxandrolone from 17.beta.-hydroxy-17.alpha.-methyl-  
5.alpha.-androstan-3-one)

RN 521-11-9 HCAPLUS

CN Androstan-3-one, 17-hydroxy-17-methyl-, (5.alpha.,17.beta.)- (9CI) (CA  
INDEX NAME)

Absolute stereochemistry.



REFERENCE COUNT:

11

THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT